OPERATION OF LOWER GRANITE PROJECT
DURING SPRING 2001

INTRODUCTION:

The 2001 juvenile fish migration season is projected to have extremely low runoff volumes in the Snake River Basin. In conjunction with the low flows, spring spill at the lower Snake collector projects is unlikely. Further, the raised spillway weir was not completed in time for installation and evaluation at Lower Granite (LGR) this season. Studies on spillway passage are not anticipated and, thus, there is the opportunity to use available funding, personnel and equipment to evaluate innovative river operations in a drought year.

OBJECTIVE:

To reduce the negative impact of low flows such as occurred in 1992 and 1994 and the associated low juvenile fish survival.

OPERATION:

Incorporating a block test design of control days and test days, and in conjunction with water releases from Dworshak and/or Brownlee, implement a short-term, substantial increase in powerhouse discharge in the early evening to at least 90 kcfs at Lower Granite Dam.

The volume in the top four feet of operating range for the LGR pool is approximately 31 kaf or 15.5 ksfd. Using only the pool, this volume could be discharged for a duration of up to eight hours to provide an additional 47 kcfs over inflow. Increased discharge at Lower Granite used in conjunction with releases from Dworshak and/or Brownlee would increase velocities in the upper and lower ends of the reservoir and reduce the refill period. If spring flow augmentation is not available, a longer refill period would be required after the increase in discharge at LGR. (Attachment 1).

BASIS:

A strong, inverse flow/travel time relationship for migrating juvenile smolts in the lower Snake River has been well documented (CBFWA 1991; Cada et al., 1997; NMFS 2000). As flow increases, water velocity increases and, thus, increases in discharge at the dam are anticipated to result in improved fish movement in the lower area of the reservoir.

In late May, 1992 three flow spikes (two one day, one on another) were implemented at Lower Granite. For the first, an 11 kcfs (55-66 kcfs) increase in the a.m. and a 15 kcfs (51-66kcfs) increase in the evening correlated with an all-species collection almost three times that of the preceding day. For the second, flows were increased in the evening from 51 to 90 kcfs for eight hours; by 7:00 the next morning, the all species index was almost double the previous day - yearling chinook numbers increased 3 ½times. The collection on the following day remained high as well.

Additional analysis showed that yearling chinook collection was 1.6 and 3.7 times greater than the previous four day average for each increase in discharge episode. PIT-tagged yearling chinook also were detected at over three times the rate of the previous four day average (Memo to FPAC, June 26, 1992).

EVALUATION:

Evaluation can include real-time monitoring and analysis of smolt collection numbers and PIT-tag detections at lower Snake River dams, and radio-tracking of migrating smolts. The Studies Review Work Group of the Corps' Anadromous Fish Evaluation Program and the Fish Passage Advisory Committee have agreed to provide support for the use of radio-tagged juvenile migrants in the evaluation.

OPERATION OF OTHER LOWER SNAKE RESERVOIRS:

Other lower Snake River reservoirs can be left at a constant elevation, passing the increased discharge from LGR down through the lower Snake.

LOWER GRANITE PROJECT BLOCK STUDY DESIGN
PROPOSED OPERATIONS

				DWORSHAK/BROWNLEE			LOWER GRANITE		
SCENARIO	Total Days	Test Replicates	Total KAF	Average Discharge, kcfs	Duration hours	Volume KAF/day	PH Surcharge Kcfs	Duration hours	Surcharge Vol, KAF
A. W/ AUG.	42	6	257	13	40	20	50	8	24*
B. W/O AUG	56	4	0	0	0	0	47	8	31
C. W/O AUG	56	4	0	0	0	0	38	10	31

A: Two test days (discharge+refill), one control day; one control day, two test days; each week = one replicate with two blocks.
Increased discharge every three/four days from LGR, 1900-0300.
Route augmentation water to coincide with increased LGR discharge and refill.

B: Five test days (discharge+refill), two control days, two control days, five test days, etc.
Each two weeks = one replicate with one block/week
Increased discharge at LGR every 10 days, 1900-0300.

C: Load follow during the day for one week, reverse load factor (nighttime increase in discharge) for one week at LGR.

* Volume from reservoir only